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EXAMINER	
LABUD, JONATHAN R	
ART UNIT	**PAPER NUMBER**
4142	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/560,257	SHAOFAN, LI	
	Examiner	Art Unit	
	JONATHAN R. LABUD	4142	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 - 20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 December 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/08/2006 and 06/16/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The instant application having Application No. 10/560,257 filed on December 9, 2005 is presented for examination by the examiner.

Examiner Notes

2. Examiner cites particular columns and lines, or particular paragraphs in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

Oath/Declaration

3. The applicant's oath/declaration has been reviewed by the examiner and is found to conform to the requirements prescribed in **37 C.F.R. 1.63.**

Priority

4. As required by **M.P.E.P. 201.14(c)**, acknowledgement is made of applicant's claim for priority based on applications filed on June 28, 2005 (PCT/CN05/00938).

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

5. As required by M.P.E.P. 609, the applicant's submissions of the Information Disclosure Statements dated June 8, 2006 and June 16, 2008 are acknowledged by the examiner and the cited references have been considered in the examination of the claims now pending.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claim 1 is rejected under 35 U.S.C. 101 as directed to non-statutory subject matter. Claims that claimed series of steps or acts that do not tie to one of another statutory category or transform to a different state or thing are not statutory within the meaning of 35 U.S.C. 101. In this instance case, the claim recites, "configuring", "recording", "storing". However, no specific tie to another statutory category or transformation to a different state or thing is claimed. Absent such a requirement, the claims are not statutory.

Claims 2-6 are rejected under 35 U.S.C. 101 as non-statutory for at least the reason stated above. Claims 2-6 are dependent on claim 1; however, they do not add any feature or subject matter that would solve any of the non-statutory deficiencies of claim 1.

8. Claim 7 is rejected under 35 U.S.C. 101 as directed to non-statutory subject matter of software, *per se*. The claim lacks the necessary physical articles or objects to constitute a

machine or manufacture within the meaning of 35 U.S.C. 101. It is clearly not a series of steps or acts to be a process nor is it a combination of chemical compounds to be a composition of matter. As such, it fails to fall within a statutory category. It is at best, function descriptive material *per se*.

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." Both types of "descriptive material" are non-statutory when claimed as descriptive material *per se*, 33 F.3d at 1360, 31 USPQ2d at 1759. When functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994).

Merely claiming non-functional descriptive material, i.e., abstract ideas, stored on a computer-readable medium, in a computer, or on an electromagnetic carrier signal, does not make it statutory. See *Diehr*, 450 U.S. at 185-86, 209 USPQ at 8 (noting that the claims for an algorithm in *Benson* were unpatentable as abstract ideas because "[t]he sole practical application of the algorithm was in connection with the programming of a general purpose computer."). In this case, applicant has claimed an apparatus where all the limitations within claims are performed by purely software modules. Therefore, claim 7 is directed to non-statutory subject matter of computer programs, per se, i.e. the descriptions or expressions of the programs, are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and

functional interrelationships between the computer program and other claimed elements of a computer, which permit the computer program's functionality to be realized.

Claims 8-10 are rejected under 35 U.S.C. 101 as non-statutory for at least the reason stated above. Claims 8-10 are dependent on claim 7; however, they do not add any feature or subject matter that would solve any of the non-statutory deficiencies of claim 7.

9. Claims 11-20 are considered statutory under 35 U.S.C. 101 because the claimed invention is directed to statutory subject matter. In this case, the specification specifically defines the term "machine accessible medium" as a type of physical hardware storage that can be read by a computer (page 3, paragraph [0006]). When functional descriptive material is recorded on some computer readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1, 2, 6, 11, 13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bala, Vasanth (U.S. 6,351,844) (hereinafter Bala) in view of Bunnell, James C. (U.S. 5,564,015) (hereinafter Bunnell).

As per claim 1, Bala discloses a method comprising "recording a branch address when the ICM is notified of a branch taken; and storing the recorded branch addresses to determine code coverage of a target program." (Bala, column 3, lines [3-7], these limitations are disclosed by Bala as "storing each branch history entry in a trace buffer, and incrementing a counter corresponding to the start address for each branch history entry in the trace buffer responsive to a selection processing signal. In this instance, the incrementing counter reads on determining code coverage as it is a way of measuring the degree to which the branch history of a source program has been analyzed."), but fails to disclose the limitation "configuring a central processing unit (CPU) to notify an information collection module (ICM) when a branch is taken."

However, Bunnell discloses the limitation "configuring a central processing unit (CPU) to notify an information collection module (ICM) when a branch is taken." (Bunnell, Figure 1 and column 4, lines [7-15], the limitation is disclosed wherein a CPU based microprocessor 20 is connected to a CPU activity monitor 24, the CPU activity monitor being notified by the CPU via a plurality of mode signals. Bunnell further discloses this limitation in Figures 2 and 3, and column 7, lines [14-23], wherein address decode logic 62, an internal component of the CPU activity monitor, is connected via address bus 34 to microprocessor 20. Being directly connect to the address bus in this manner, the CPU activity monitor is notified by the processor when an event involving a memory address change takes place. This would allow CPU activity monitor 24 to recognize the occurrence of a branch event.)

Bala and Bunnell are analogous art because they are from the same field of endeavor, testing and analysis of program execution.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system as taught by Bala and use a CPU to send notification signals indicating events as taught by Bunnell because it would provide for the purpose of reducing the complexity of CPU activity monitoring (see Bunnell, column 3, lines [40-45]).

As per claim 2, Bala, in view of Bunnell, discloses "The method of claim 1," (See rejection to claim 1 above) as well as the further limitation wherein "storing the recorded branch addresses comprises storing the recorded branch addresses in a buffer" (Bala, column 3, lines [4-5], this limitation is disclosed as "storing each branch history entry in a trace buffer").

As per claim 6, Bala, in view of Bunnell, discloses "The method of claim 1," (See rejection to claim 1 above) but fails to disclose the further limitation wherein "configuring a CPU to notify an information collection module when a branch is taken comprises configuring a CPU to notify an information collection module via an interruption when a branch is taken."

However, Bunnell discloses the further limitation wherein "configuring a CPU to notify an information collection module when a branch is taken comprises configuring a CPU to notify an information collection module via an interruption when a branch is taken." (Bunnell, Figure 1, column 2, lines [53-65] and column 6, lines [40-47], the limitation is disclosed wherein a CPU based microprocessor is connected to a CPU activity monitor, the CPU activity monitor being notified of events via signals from the CPU. Events being monitored can include interrupts from the CPU.)

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system as taught by Bala and use a CPU to send notification signals in the form of interrupts as taught by Bunnell because it would provide for the purpose of allowing the system to be easily controlled by individual flag bits (see Bunnell, column 5, lines [3-13]).

Regarding claim 11, it is an article claim having similar limitations cited in claim 1. Thus, claim 11 is also rejected under the same rationales as cited in the rejection of claim 1.

Regarding claim 13, it is an article claim having similar limitations cited in claim 2. Thus, claim 13 is also rejected under the same rationales as cited in the rejection of claim 2.

Regarding claim 16, it is an article claim having similar limitations cited in claim 6. Thus, claim 16 is also rejected under the same rationales as cited in the rejection of claim 6.

12. Claims 3 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bala in view of Bunnell as applied to claim 1 above, and further in view of Erickson, Bruce A. (U.S. 4,914,659) (hereinafter Erickson)..

As per claim 3, Bala, in view of Bunnell, discloses "The method of claim 1," (See rejection to claim 1 above) but fails to disclose the further limitation which comprises "providing the recorded branch addresses to a coverage pattern generation module (CPGM) to interpret and display code coverage statistics."

However, Erickson discloses the further limitation which comprises "providing the recorded branch addresses to a coverage pattern generation module (CPGM) to interpret and display code coverage statistics." (Erickson, column 5, lines [33-40], the limitation is disclosed

wherein information on which branches in a program were taken are provided to software module bbareport for processing into a written text coverage report. The software module as disclosed by Erickson reads on the coverage pattern generation module since they both perform the same function.)

Bala and Erickson are analogous art because they are from the same field of endeavor, testing and analysis of program execution.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the use of stored branch information as taught by Bala and use the branch information to create a coverage report as taught by Erickson because it would provide for the purpose of indicating at a glance which branches in a program were or were not executed (see Erickson, column 5, lines [40-42]).

Regarding claim 12, it is an article claim having similar limitations cited in claim 3. Thus, claim 12 is also rejected under the same rationales as cited in the rejection of claim 3.

13. Claim 4-5 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bala in view of Bunnell as applied to claim 1 above, and further in view of Angel et al. (U.S. 2002/0095661) (hereinafter Angel).

As per claim 4, Bala in view of Bunnell discloses "The method of claim 1," (See rejection to claim 1 above) but fails to disclose the further limitation wherein "the target program is to be run in a virtual machine."

However, Angel discloses the further limitation wherein "the target program is to be run in a virtual machine" (Angel, paragraph [0125], the limitation is disclosed wherein programs are executed by a software program referred to as a virtual machine.)

Bala and Angel are analogous art because they are from the same field of endeavor, testing and analysis of program execution.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the environment for a target program as taught by Bala and run the target program in a virtual machine as taught by Angel because it would provide for the purpose that while the program is running in a virtual machine, it is independent of the computer hardware and operating system on which is running (see Angel, paragraph [0125]), and furthermore, facilitating the gathering of diagnostic and statistical information on the program while it is being executed, allowing for dynamic code analysis (see Angel, paragraph [0126]).

As per claim 5, Bala, in view of Bunnell, and further in view of Angel, discloses "The method of claim 4," (See rejection to claim 4 above) but fails to disclose the further limitation wherein "the information collection module is part of a virtual machine monitor that is coupled to the virtual machine to collect code coverage information about the target program"

However, Angel discloses the further limitation wherein "the information collection module is part of a virtual machine monitor that is coupled to the virtual machine to collect code coverage information about the target program" (Angel, paragraph [0126], paragraph [135] and Fig. 12, Angel discloses a monitor component connected to a virtual machine, the monitor component gathering program information as the program is executed, then providing this information for code coverage analysis)

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of code coverage analysis as taught by Bala and use the monitor component as taught by Angel because it would provide for the purpose of enabling the program information obtained to be easily sent to a plurality of code analyzers (see Angel, paragraph [0135]).

Regarding claim 14, it is an article claim having similar limitations cited in claim 4. Thus, claim 14 is also rejected under the same rationales as cited in the rejection of claim 4.

Regarding claim 15, it is an article claim having similar limitations cited in claim 5. Thus, claim 15 is also rejected under the same rationales as cited in the rejection of claim 5.

14. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Angel in view of Bunnell, and further in view of Bala.

As per claim 7, Angel discloses "An apparatus comprising: a virtual machine (VM) on which a target program is to execute;" (Angel, paragraph [0125], the limitation is disclosed wherein programs are executed by a software program referred to as a virtual machine) "and a virtual machine monitor (VMM) coupled to the virtual machine to gather code coverage information about the target program," (Angel, paragraph [0126], paragraph [135] and Fig. 12, Angel discloses a monitor component connected to a virtual machine, the monitor component gathering program information as the program is executed, then providing this information for code coverage analysis) but fails to disclose expressly the further limitations directed to "the VMM including an information collection module (ICM) to configure a central processing unit

(CPU) to notify the ICM when a branch is taken and to record a branch address when a branch is taken."

Bunnell discloses the further limitation directed to "the VMM including an information collection module (ICM) to configure a central processing unit (CPU) to notify the ICM when a branch is taken" (Bunnell, Figure 1 and column 6, lines [40-47], the limitation is disclosed wherein a CPU based microprocessor is connected to a CPU activity monitor, the CPU activity monitor being notified of events via signals from the CPU.)

Angel and Bunnell are analogous art because they are from the same field of endeavor, activity monitoring.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system as taught by Angel and use a CPU to send notification signals indicating events as taught by Bunnell it would provide for the purpose of reducing the complexity of CPU activity monitoring (see Bunnell, column 3, lines [40-45]).

Furthermore, Bala discloses the further limitation wherein the information collection module is used "to record a branch address when a branch is taken." (Bala, column [4], line [53], with respect to this limitation Bala discloses "a method for selecting active traces in an executing program for translation into a translated code cache" wherein a trace is defined (line [55]) to be "a sequence of dynamic instructions terminated by the execution of a 'trace-ending' branch.").

Angel and Bala are analogous art because they are from the same field of endeavor, testing and analysis of program execution

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the virtual machine and monitor component as taught by Angel to include the ability to

record branch information as described by Bala because it would provide for the purpose of allowing focused analysis to determine parts of the executing program in the virtual machine where greater performance benefit is likely (Bala, column 2, lines [28-31]).

As per claim 8, Angel, in view of Bunnell, and further in view of Bala, discloses "The apparatus of claim 7," (See rejection to claim 7 above) but fails to disclose the limitation wherein "the VMM further comprises a buffer to store the branch address recorded by the information collection module."

However, Bala discloses the limitation wherein "the VMM further comprises a buffer to store the branch address recorded by the information collection module" (Bala, column 3, lines [4-5], this limitation is disclosed as "storing each branch history entry in a trace buffer")

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the storage location of code coverage information as described by Angel, using a buffer as taught by Bala because it would provide for the purpose of allowing a stack setup that stores a multitude of branch information, including branch addresses and status (Bala, Figures 3 and 8).

As per claim 9, Angel, in view of Bunnell, and further in view of Bala, discloses "The apparatus of claim 7," (See rejection to claim 7 above) but fails to disclose the further limitation wherein "the CPU notifies the information collection module of a branch taken via an interruption."

However, Bunnell discloses the further limitation wherein "the CPU notifies the information collection module of a branch taken via an interruption." (Bunnell, Figure 1, column 2, lines [53-65] and column 6, lines [40-47], the limitation is disclosed wherein a CPU based

microprocessor is connected to a CPU activity monitor, the CPU activity monitor being notified of events via signals from the CPU. Events being monitored can include interrupts from the CPU.)

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system as taught by Angel and use a CPU to send notification signals in the form of interrupts as taught by Bunnell because it would provide for the purpose of allowing the system to be easily controlled by individual flag bits (see Bunnell, column 5, lines [3-13]).

15. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Angel in view of Bunnell and Bala as applied to claim 7 above, and further in view of Erickson.

As per claim 10, Angel, in view of Bunnell, and further in view of Bala, discloses "The apparatus of claim 7," (See rejection to claim 7 above) but fails to disclose expressly the limitation which further comprises "a coverage pattern generation module (CPGM) coupled to the VMM to interpret the branch addresses and a source file of the target program and to display code coverage statistics about the target program."

However, Erickson discloses the limitation which further comprises "a coverage pattern generation module (CPGM) coupled to the VMM to interpret the branch addresses and a source file of the target program and to display code coverage statistics about the target program." (Erickson, column 5, lines [33-40], the limitation is disclosed wherein information on which branches in a program were taken are provided to software module bbareport for processing into

a written text coverage report. The software module as disclosed by Erickson reads on the coverage pattern generation module since they both perform the same function.")

Angel and Erickson are analogous art because they are from the same field of endeavor, testing and analysis of program execution.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the virtual machine and monitor component as taught by Angel and use the code coverage information to generate a report as taught by Erickson because it would provide for the purpose of indicating at a glance which branches in a program were or were not executed (see Erickson, column 5, lines [40-42]).

16. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bala in view of Chen, Ding-Kai (U.S. 2002/0010879) (hereinafter Chen), and further in view of Bunnell.

As per claim 17, Bala discloses a method comprising "recording a branch address when the ICM is notified of a branch taken; and storing the recorded branch addresses to determine code coverage of a target program." (Bala, column 3, lines [3-7], these limitations are disclosed by Bala as "storing each branch history entry in a trace buffer, and incrementing a counter corresponding to the start address for each branch history entry in the trace buffer responsive to a selection processing signal. In this instance, the incrementing counter reads on determining code coverage as it is a way of measuring the degree to which the branch history of a source program has been analyzed."), but fails to disclose the limitations of A system comprising: "a processor; a network interface coupled to the processor; and a machine accessible medium including content

that when accessed by a machine causes the machine to perform operations including: configuring a central processing unit (CPU) to notify an information collection module (ICM) when a branch is taken;"

Chen discloses the limitation of "a processor; a network interface coupled to the processor; and a machine accessible medium including content that when accessed by a machine causes the machine to perform operations" (Chen, Figure 1, paragraph [0035] and paragraphs [0069-0070]).

Bala and Chen are analogous art because they are from the same field of endeavor, testing and analysis of program execution.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method as taught by Bala and use a processor, network interface, and machine accessible medium as taught by Chen because it would provide for the purpose of providing enablement so the invention can be used by a typical computer-based system, the computer-based system including a processor and network interface (see Figure 1, paragraph [0035] and paragraphs [0069]).

Furthermore, Bunnell discloses the limitation of "configuring a central processing unit (CPU) to notify an information collection module (ICM) when a branch is taken" (Bunnell, Figure 1 and column 4, lines [7-15], the limitation is disclosed wherein a CPU based microprocessor 20 is connected to a CPU activity monitor 24, the CPU activity monitor being notified by the CPU via a plurality of mode signals. Bunnell further discloses this limitation in Figures 2 and 3, and column 7, lines [14-23], wherein address decode logic 62, an internal component of the CPU activity monitor, is connected via address bus 34 to microprocessor 20.

Being directly connect to the address bus in this manner, the CPU activity monitor is notified by the processor when an event involving a memory address change takes place. This would allow CPU activity monitor 24 to recognize the occurrence of a branch event.)

Bala and Bunnell are analogous art because they are from the same field of endeavor, testing and analysis of program execution.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system as taught by Bala and use a CPU to send notification signals indicating events as taught by Bunnell because it would provide for the purpose of reducing the complexity of CPU activity monitoring (see Bunnell, column 3, lines [40-45]).

17. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bala in view of Chen and further in view of Bunnell as applied to claim 17 above, and further in view of Erickson.

As per claim 18, Bala, in view of Chen, and further in view of Bunnell, discloses "The system of claim 17," (See rejection to claim 17 above) but fails to disclose expressly the limitation wherein "the machine-accessible medium further includes content that causes the machine to perform operations comprising providing the recorded branch addresses to a coverage pattern generation module (CPGM) to interpret and display code coverage statistics."

However, Erickson discloses the further limitation wherein "the machine-accessible medium further includes content that causes the machine to perform operations comprising providing the recorded branch addresses to a coverage pattern generation module (CPGM) to

interpret and display code coverage statistics." (Erickson, column 5, lines [33-40], the limitation is disclosed wherein information on which branches in a program were taken are provided to software module bbareport for processing into a written text coverage report. The software module as disclosed by Erickson reads on the coverage pattern generation module since they both perform the same function.)

Bala and Erickson are analogous art because they are from the same field of endeavor, testing and analysis of program execution.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the use of stored branch information as taught by Bala and use the branch information to create a coverage report as taught by Erickson because it would provide for the purpose of indicating at a glance which branches in a program were or were not executed (see Erickson, column 5, lines [40-42]).

18. Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bala in view of Chen and further in view of Bunnell as applied to claim 17 above, and further in view of Angel.

As per claim 19, Bala, in view of Chen, and further in view of Bunnell, discloses "The system of claim 17," (See rejection to claim 17 above) but fails to disclose expressly the limitation wherein "the target program is to be run on a virtual machine."

However, Angel discloses the further limitation wherein "the target program is to be run on a virtual machine" (Angel, paragraph [0125], the limitation is disclosed wherein programs are executed by a software program referred to as a virtual machine).

Bala and Angel are analogous art because they are from the same field of endeavor, testing and analysis of program execution.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the environment for a target program as taught by Bala and run the target program in a virtual machine as taught by Angel because it would provide for the purpose that while the program is running in a virtual machine, it is independent of the computer hardware and operating system on which is running (see Angel, paragraph [0125]). Furthermore, this method facilitates the gathering of diagnostic and statistical information on the program while it is being executed, allowing for dynamic code analysis (see Angel, paragraph [0126]).

As per claim 20, Bala, in view of Chen, and further in view of Bunnell, discloses "The method of claim 17," (See rejection to claim 17 above) but fails to disclose the further limitation wherein "the information collection module is part of a virtual machine monitor that is coupled to the virtual machine to collect code coverage information about the target program"

However, Angel discloses the further limitation wherein "the information collection module is part of a virtual machine monitor that is coupled to the virtual machine to collect code coverage information about the target program" (Angel, paragraph [0126], paragraph [135] and Fig. 12, Angel discloses a monitor component connected to a virtual machine, the monitor component gathering program information as the program is executed, then providing this information for code coverage analysis)

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of code coverage analysis as taught by Bala and use the monitor component as taught by Angel because it would provide for the purpose of enabling the program information obtained to be easily sent to a plurality of code analyzers (see Angel, paragraph [0135]).

Conclusion

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Labud whose telephone number is 571-270-5174. The examiner can normally be reached on Monday to Friday 6:30 AM to 4:00 PM.

If attempts to reach the above noted Examiner by telephone are unsuccessful, the Examiner's supervisor, Thomas Pham, can be reached at the following telephone number: (571) 272-3689.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

April 9, 2009

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